UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/689,976	10/21/2003	Glenn A. Rinne	9180-24	3798

7590 06/14/2006

Scott C. Hatfield, Esq.
Myers Bigel Sibley & Sajovec, P.A.
P.O. Box 37428
Raleigh, NC 27627

EXAMINER	
LEE, EDDIE C H	

ART UNIT	PAPER NUMBER
2811	

DATE MAILED: 06/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/689,976	RINNE, GLENN A.	
	Examiner	Art Unit	
	Eddie C. Lee	2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 March 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,6-60 and 62* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6-60 and 62* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 October 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Allowable Subject Matter

The indicated allowability of claims 5, 6, 9-20, 23-24, 26-41, 44 and 52-60 is withdrawn in view of the newly discovered reference(s). Rejections based on the newly cited reference(s) follow.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "heat dissipating layer between the first and second electronic substrates" must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner,

the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 19 and 52 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The limitations "wherein the signal path is free of electrical coupling with an electronic circuit of the third electronic substrate" inaccurately defines the invention. That is, whether directly or indirectly, all the electronic components of the instant invention are electrically coupled.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-4, 6-8, 22-29, 42-44, 46-48, and 54-58 are under 35 U.S.C. 102(b as being anticipated by McCormick.

McCormick discloses in Fig. 4 an electronic device comprising a first 402, second 412 and third 410 electronic substrates. The device further includes first 414, second 422 and third 416 electrical and mechanical connections. Although specific connections of McCormick were matched with the specific connections recited in the claims, other than the "first electrical and mechanical connection" due to the limitation of "bypasses the second substrate," the second and third connections are readable on any of McCormick's connections since they all serve as "electrical and mechanical" connections for all substrates of the device. Furthermore, note column 6, lines 59 and 60, where McCormick discloses a printed circuit board, and the term "adjacent" does not require any particular side the substrate to face any particular side of another substrate.

Regarding claims 2, 3, 22 and 29, both ends of the first and third electronic substrate and the first electrical and mechanical connection 414 extend beyond the end of the second substrate, and the term "offset" is merely a relative term that does not structurally distinguish the claims over the prior art.

Regarding claims 4, 6-8, 24, 26, 28 and 42, all three substrates will and must have "conductive traces" or lines for electrical communication therebetween. Also, note the connection 414 is much larger than connections 416 and 422.

Regarding claim 55, substrate 412 has bumps 422 on one side and pads on the other since bumps 416 can be interpreted as belonging to substrate 402.

Regarding claim 57, the interconnection structure on the surfaces of substrate 412 can be interpreted as a minimum of four equally or substantially equal sets of interconnection arrays.

Claims 9-19, 42- 52, 54-60, and 62 are rejected under 35 U.S.C. 102(e) as being anticipated by Lin et al.

Regarding claim 9, Lin et al. discloses an electronic device in Fig. 2A comprising first CH2, second CH3 and third CH4 electronic substrates, a first electrical and mechanical connection BSB between the first and third substrates, and a second electrical and mechanical connection B between the second and third substrates. Also, the term "adjacent" does not require any particular side the substrate to face any particular side of another substrate.

Regarding claims 10-14, Lin et al. discloses in paragraphs 0076 and 0077 that the electronic substrates are memory device. And claims 11 and 13 merely recite routine data communication when the electronic device is in use.

Regarding claim 15, Lin et al. discloses an electronic device in Fig. 2A comprising first CH2, second CH3 and third CH 4 electronic substrates, a first electrical and mechanical connection, readable on at least one of the BSB between PCB2 and PCB3, a second electrical and mechanical connection, readable on bumps B on CH3, and printed circuit board PCB2. Lin et al. further discloses a third, readable on bumps B

on CH2, fourth, readable on the other BSB, and fifth, readable on bumps B on CH3, electrical and mechanical connections.

Regarding claim 16, note the that BSB is larger than bumps B, hence the respective pads on the PCB2 must likewise be sized to accommodate this difference in size.

Regarding claim 17, all the substrates, passive and active, in Lin et al. will and must have "conductive traces" or lines for electrical communication therebetween.

As for claim 18, the limitations merely recite routine data communication when the electronic device is in use.

Regarding claim 19, the following explanation is for exemplary purposes only since the claims can be read on Fig. 2B in a variety of ways. Lin et al. discloses in Fig. 2B, a first CH2, second CH3, third CH4, fourth CH 5, and fifth CH6 electronic substrates. Lin et al. further discloses first (BSB between PCB2 and PCB3), second (bump B on CH3), third (bump B on CH4), fourth (BSB between PCB3 and PCB4) and fifth (bump on CH6) electrical and mechanical connections.

Regarding claim 54, the substrate such as PCB4 has at least 4 sets of interconnection structure on the surface thereof. Like the instant invention, it can be said that the bumps on one side of the substrate belongs to the adjoining substrate.

Claim 21 is rejected under 35 U.S.C. 102(e) as being anticipated by Mess et al.

Mess et al. discloses in at least Fig. 23 an electronic device having at least three substrates 60A, 60B and 60C, where the middle substrate is staggered relative to the other substrates resulting in the claim language recited in claim 21.

Claims 42 and 53 rejected under 35 U.S.C. 102(e) as being anticipated by Eldridge.

Eldridge discloses an electronic device comprising at least three electronic substrates 24 or 26 each having on both surfaces "signal path" or traces for electrically connecting each of the substrates. Furthermore, Eldridge discloses a "heat dissipating: layer 42 between each of the substrates.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 20 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over McCormick in view of Kato et al.

The difference between McCormick and the claimed invention is "a heat dissipating layer between the first and second electronic substrates, wherein the heat dissipating layer includes a material that is thermally conductive." However, Eldridge discloses an electronic device having "a heat dissipating layer [42] between [at least

two] electronic substrates, wherein the heat dissipating layer includes a material that is thermally conductive."

In view of such teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify McCormick by including "a heat dissipating layer between the first and second electronic substrates, wherein the heat dissipating layer includes a material that is thermally conductive." The ordinary artisan would have been motivated to modify McCormick in the manner described above for at least the purpose of cooling the electronic substrates thus minimizing the possibility of heat damage.

Claims 21 and 29-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al. in view of Mess et al.

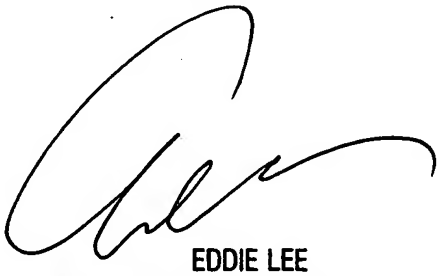
The above anticipatory rejection with respect to the Lin et al reference is incorporated herein by reference for limitations not specifically mentioned in the rejection but disclosed by Lin et al. The difference between Lin et al. and the claimed invention is a staggered arrangement of the electronic substrate such that "the second electronic substrate is offset relative to the first and third substrates so that the first and third electronic substrates extend beyond an end of the second electronic substrates" and "the first, third, and fifth electronic substrates extend beyond the forth electronic substrates." However, Mess et al. discloses in at least Fig. 23 each of the electronic substrates being staggered relative to its adjacent electronic substrates.

In view of such teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Lin et al. by staggering each electronic substrates relative to it's adjacent electronic substrates such that "the second electronic substrate is offset relative to the first and third substrates so that the first and third electronic substrates extend beyond an end of the second electronic substrates" and "the first, third, and fifth electronic substrates extend beyond the forth electronic substrates." The ordinary artisan would have been motivated to modify Lin et al. in the manner described above for at least the purpose of more evenly distributing the substrates within the package resulting in improved heat dissipation.

Conclusion

Applicant's arguments with respect to all the claims have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication should be directed to Eddie C. Lee at telephone number 571-272-1732.



EDDIE LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800